

REMARKS

Claims 15, 31, 32 and 40 have been rejected under 35 U.S.C. §112, second paragraph. Claims 15, 31 and 40 have been amended to address the issues raised by the Examiner, and thus Applicants respectfully request that this rejection be withdrawn.

Applicants will next address the prior art rejections as they apply to each of the independent claims.

Claim 40

Claim 40 features a method of producing a soy germ concentrate comprising separating soy germ from a cracked soybean stream wherein the cracked soybean stream contains soybean meats, germs and hulls. The method includes separating the germs from the meats based on the respective sizes of the germs and meats.

Claim 40 has been rejected as anticipated by JP 11-196803. It is noted that this reference is the Japanese counterpart of U.S. Patent No. 5,952,230 (both share the same Korean priority information), which is the Kim reference cited by Applicants and relied upon by the Examiner in the §103 rejection of claims 16-17, 19/16, 20-24 and 26. Thus, in discussing this rejection, reference will be made to the text of the Kim reference as well as the English language abstract and mechanical translation of the JP reference referred to by the Examiner.

Applicants respectfully submit that JP 11-196803 does not teach "separating the germs from the meats based on the respective sized of the germs and the meats," as required by claim 40, and thus does not anticipate claim 40.

The Examiner directs Applicants' attention to the English-language abstract and to paragraphs 7 and 8 of the Detailed Description in the mechanical translation, stating that these portions of the text disclose "separating the soy germ from a cracked soybean stream wherein the germ is removed from other soybean material (including meats) based on respective sizes" and the "use of, for example, sieve in separating embryo from the rest of the soy bean material."

The machine translation is so ungrammatical as to be virtually unreadable. However, it appears that the content of the JP document corresponds generally to that of its U.S. counterpart (Kim, U.S. Patent No. 5,952,230). Thus, reference will be made to the relevant passages of Kim.

Kim obtains purified soy germ from the hull stream (i.e., from the hull/embryo mixture that is separated from the split soybeans during “peeling” – see Fig. 1 and col. 2, lines 49-51). Separation and recovery of the germ (embryos) from the hulls and any remaining meat particles is accomplished by gravity separation, rather than size separation, based on the difference in specific gravity between the hulls/meats and the embryos (see, e.g., col. 4, lines 17-19). Thus, Kim states that: “it is an object of the present invention to provide a mechanical method for separating soybean embryo in high purity, *using a gravity or weight difference* between the endosperm and the embryo to separate only the embryo from the soybean,” (col. 1, lines 59-63, emphasis ours), “embryos are separated from the soybeans by means of a mechanical separation method using *weight or gravity difference* between embryo and endosperm” (col. 2, lines 37-38, emphasis ours), and “only the embryos are separated from the hulls when the mixture is separated by gravity difference” (col. 2, lines 57-59).

The Examiner appears to be focusing on Kim’s mention of sifting and sieving steps. What happens at each step of Kim’s process is not made explicit (for example, it is unclear what happens during the “peeling” step). However, as discussed above, Fig. 1 indicates that the bulk of the split soybeans are removed during or after peeling, and any remaining meat particles are removed by gravity separation. Thus, the sieving/sifting steps are used to separate the germs (embryos) from the hulls, not the germs from the meats. This interpretation is supported by the text at col. 2, lines 53-55 and col. 3, lines 9-10, which states that “..the mixture of hulls and embryos...is sifted.” This interpretation is also consistent with a conventional cracking process, in which the meat particles that would be present in the hull stream would be similar in size to the germ and thus would be difficult if not impossible to separate from the germ based on size.

Moreover, even if Kim intended to separate germs from meats by a size separation – which does not seem to be the case – there is no enabling teaching as to how separation of embryos from meats by size would be accomplished. It is *Applicants own disclosure* that

provides this teaching.

Claim 10

Claim 10, as amended, features a method of producing a soy germ concentrate comprising: (a) cracking whole soybeans to produce a cracked soybean stream having a cracked size such that about 50% of the cracked particles are larger than 3.35 mm; (b) prior to any further cracking, separating soy germ from the cracked soybean stream; and (c) after separating, further processing the cracked soybean stream that remains after the soy germ has been removed to produce a soybean product. Because the cracked soybean stream has the claimed size distribution, most of the meats are dramatically larger than the germ, which typically has an average particle size of less than three cubic millimeters. (See Applicant's disclosure, page 3, second paragraph.) As a result, the germ can be separated from the meats by size, to form a soy germ concentrate containing a relatively high percentage of soy germ, and the meats can be reintroduced into the soybean processing stream. (*Id.*)

Claims 10-12 have been rejected under 35 U.S.C. 103(a) as being unpatentable over either one of WO 96/10341 or WO 93/23069, and dependent claims 13-15 have been rejected as being unpatentable over either of these references further in view of "Applicants' own admission" (Applicants' description of conventional soybean processing in the Background section of Applicants' specification, hereafter "AOA").

WO 96/10341 and WO 93/23069, whether taken alone or in any proper combination, would not have suggested the claimed process to the artisan.

WO 96/10341 does not teach or suggest separating soy germ from cracked soybeans having the claimed particle size distribution. Instead, in the only example directed to soy germ separation, the soy beans are "broken by a crushing roller to obtain 2 to 20 pieces per seed." (WO 96/10341, Example 1, page 5.) This size distribution corresponds to the conventional cracking process, described in Applicant's specification at p. 2, lines 1-2, in which "soybean meats" are cracked "into quarters and eighths (i.e. a large portion of the meats are in quarter or eighth size pieces)." Quarters have a size of approximately 3.2 mm, while eighths have a size of

approximately 1.6 mm, and thus more than 50% of the particles of the cracked soybean stream would have a particle size significantly less than 3.35 mm.

WO 93/23069 does not teach or suggest a process involving soybean cracking or a cracked soybean stream. Instead, WO 93/23069 is directed to an entirely different soy germ separation process, in which soybeans are tumbled rather than cracked. According to Example 2, "the beans then were processed through a tumble mill which removed the hull and split the bean the [sic] the two cotyledons and the small-sized hypocotyls which separated from each other." (WO 93/23069 at page 18, lines 25-29). This process requires different equipment and conditions, including pre-heating the beans until they are brittle and tumbling the beans (*id.*), and thus would not have led the artisan to modify the particle size distribution used in conventional cold cracking processes.

Moreover, neither references suggests further processing of the soybean stream that remains after the soy germ is separated out. Both references are focused entirely on obtaining a purified soy germ product, and view the remaining cracked soybean stream (cotyledons) as a waste stream of no interest.

The Examiner acknowledges that "it is not clear from these references whether or not the 'soybean stream has a cracked size such that about 50% of the cracked particles are larger than 3.35 mm'", but apparently does not give this claim limitation patentable weight, adding that "it is not seen where same would provide for a patentable distinction given the high purity attained using similar steps of crushing and separating germ."

Applicants respectfully submit that, contrary to the Examiner's assertion, the cited references are not using similar steps to separate soy germ. Instead, WO 96/10341 is cracking soybeans to a much smaller particle size distribution, which renders size separation of germs from meats impracticable, while WO 93/23069 does not relate to a cracking process at all.

"AOA," cited to support the rejection of dependent claims 13-15, adds nothing of relevance regarding the size limitation recited in claim 10.

Thus, Applicants request that this rejection be withdrawn.

Claims 16 and 27

Independent claim 16, and dependent claims 17, 19/16, 20-24 and 26, have been rejected as being unpatentable over AOA taken together with Kim et al. (U.S. Patent No. 5,952,230). Dependent claims 18, 19/18, 27-32 and 34-36, and independent claim 27, have been rejected as being unpatentable over AOA and Kim further in view of Uesugi et al. (U.S. Patent No. 5,866,192). Dependent claims 25 and 33 have been rejected as being unpatentable over AOA, Kim, and Uesugi (re claim 33) further in view of Strop (U.S. Patent No. 4,944,954). Dependent claim 28 has been rejected as being unpatentable over AOA, Kim and Uesugi further in view of either WO 96/10341 or WO 93/23069.

Claim 16 features an in-line process for separating a cracked soybean stream that includes separating a portion of germ from the stream, and then processing the remaining stream to form soybean oil and solvent laden white flakes. Kim is concerned only with obtaining a purified soy germ (embryo) product, and does not specify what is done with the meats. The examiner asserts that it would have been obvious to incorporate Kim's embryo separation steps into the prior art processes described in the Background (AOA). Applicants respectfully disagree. Absent impermissible hindsight, there is simply no suggestion to do so. It is axiomatic that such a suggestion must be found *in the cited references*.

Moreover, the art of record provides no teaching or suggestion which would have enabled one skilled in the art to integrate the separation of soy germ into a process for forming soybean oil and solvent laden white flakes. It is important that, in Applicant's invention as recited in claim 16, the separation of soy germ and the manufacture of soybean oil and solvent laden white flakes are steps in an in-line process, rather than separate processes. Applicant's integration of soy germ separation into an existing process for forming soybean oil and solvent laden white flakes makes the separation process economically viable, whereas performed on its own the separation would be prohibitively expensive.

Claim 27 recites two cracking steps. In the process of claim 27, soybeans are cracked to form a first soybean product, that product is separated into a soy germ concentrate and a second

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soybean product, and then the second soybean product is cracked. None of the art of record, taken alone or in any proper combination, teaches or suggests this second cracking step.

In view of the above, Applicant respectfully requests that all rejections be withdrawn, and submits that the claims are in condition for immediate allowance.

Enclosed is a \$120 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 07406-016001.

Respectfully submitted,

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